

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

TQ DELTA, LLC,

Plaintiff,

v.

**COMMSCOPE HOLDING COMPANY, INC.,
COMMSCOPE INC., ARRIS
INTERNATIONAL LIMITED, ARRIS
GLOBAL LTD., ARRIS US HOLDINGS, INC.,
ARRIS SOLUTIONS, INC., ARRIS
TECHNOLOGY, INC., and ARRIS
ENTERPRISES, LLC,**

Defendants.

CIV. A. NO. 2:21-CV-310-JRG
(Lead Case)

TQ DELTA, LLC,

Plaintiff,

v.

**NOKIA CORP., NOKIA SOLUTIONS AND
NETWORKS OY, and NOKIA OF AMERICA
CORP.,**

Defendants.

CIV. A. NO. 2:21-CV-309-JRG
(Member Case)

NOKIA OF AMERICA CORP.,

Third-Party Plaintiff,

v.

**BROADCOM CORP., BROADCOM INC., and
AVAGO TECHNOLOGIES
INTERNATIONAL SALES PTE. LTD.,**

*Third-Party
Defendants.*

**DEFENDANTS' RESPONSIVE
CLAIM CONSTRUCTION BRIEF**

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1	U.S. Patent No. 7,570,686 (the “686 Patent”)
2	U.S. Patent No. 9,014,193 (the “193 Patent”)
3	U.S. Patent No. 9,300,601 (the “601 Patent”)
4	U.S. Patent No. 9,894,014 (the “014 Patent”)
5	U.S. Patent No. 8,495,473 (the “5473 Patent”)
6	U.S. Patent No. 7,844,882 (the “882 Patent”)
7	U.S. Patent No. 9,547,608 (the “608 Patent”)
8	U.S. Patent No. 10,409,510 (the “510 Patent”)
9	U.S. Patent No. 8,090,008 (the “008 Patent”)
10	U.S. Patent No. 10,567,112 (the “112 Patent”)
11	U.S. Patent No. 8,594,162 (the “162 Patent”)
12	U.S. Patent No. 9,485,055 (the “055 Patent”)
13	U.S. Patent No. 9,094,348 (the “348 Patent”)
14	U.S. Patent No. 10,833,809 (the “809 Patent”)
15	U.S. Patent No. 8,595,577 (the “577 Patent”)
16	U.S. Patent No. 8,468,411 (the “411 Patent”)
17	U.S. Patent No. 10,044,473 (the “4473 Patent”)
18	U.S. Patent No. 9,154,354 (the “354 Patent”)
19	U.S. Patent No. 8,937,988 (the “988 Patent”)
20	U.S. Patent No. 8,276,048 (the “048 Patent”)
21	U.S. Patent No. 7,453,881 (the “881 Patent”)
22	U.S. Patent No. 8,462,835 (the “835 Patent”)
23	Declaration of Bruce McNair Regarding Claim Construction (“McNair Decl.”)
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29	Family 6 Claim Construction Memorandum Opinion in the Delaware Cases (“Family 6 CC Mem. Op.”)
30	Family 2 Claim Construction Memorandum Opinion in the Delaware Cases (“Family 2 CC Mem. Op.”)
31	Claim Chart for U.S. Patent No. 7,844,882 – F3 – VDSL2 – Nokia (“882 Patent Claim Chart for Nokia”)
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33	Declaration of Dr. Todor Cooklev in Support of Plaintiff’s Opening Claim Construction Brief (“Cooklev Decl.”)

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34	ADTRAN Case <i>Markman</i> Hearing Tr., dated Mar. 18, 2021
35	Family 1 Claim Construction Memorandum Opinion in the Delaware Cases (“Family 1 CC Mem. Op.”)
36	Family 6 Claim Construction Order in the Delaware Cases (“Family 6 CC Order”)

TABLE OF ABBREVIATIONS

Abbreviation	Term
Nokia	Nokia of America Corporation, Nokia Corporation, and Nokia Solutions and Networks Oy
CommScope	CommScope Holding Company, Inc., CommScope Inc., ARRIS US Holdings, Inc., ARRIS Solutions, Inc., ARRIS Technology, Inc., and ARRIS Enterprises, LLC
Defendants	Nokia and CommScope
TQ Delta or Plaintiff	TQ Delta, LLC
POSITA	Person of ordinary skill in the art
The ADTRAN Case	<i>TQ Delta LLC v. ADTRAN Inc.</i> , No. 1:14-cv-00954-RGA (D. Del.)
The 2Wire Case	<i>TQ Delta LLC v. 2Wire Inc.</i> , No. 1:13-cv-01835-RGA (D. Del.)
The Delaware Cases	The ADTRAN Case and the 2Wire Case
TQD Br.	TQ Delta's Opening Brief, Dkt. 124
The Family 1 Patent	U.S. Patent No. 7,570,686 (the "'686 Patent")
The Family 2 Patents	U.S. Patent No. 7,453,881 (the "'881 Patent"); U.S. Patent No. 9,014,193 (the "'193 Patent"); U.S. Patent No. 9,300,601 (the "'601 Patent"); U.S. Patent No. 9,894,014 (the "'014 Patent")
The Family 3 Patents	U.S. Patent No. 8,495,473 (the "'5473 Patent"); U.S. Patent No. 7,844,882 (the "'882 Patent"); U.S. Patent No. 9,547,608 (the "'608 Patent"); U.S. Patent No. 10,409,510 (the "'510 Patent"); U.S. Patent No. 8,276,048 (the "'048 Patent")
The Family 4 Patent	U.S. Patent No. 8,090,008 (the "'008 Patent")
The Family 6 Patents	U.S. Patent No. 8,462,835 (the "'835 Patent"); U.S. Patent No. 10,567,112 (the "'112 Patent"); U.S. Patent No. 8,594,162 (the "'162 Patent")
The Family 9 Patents	U.S. Patent No. 9,485,055 (the "'055 Patent"); U.S. Patent No. 9,094,348 (the "'348 Patent"); U.S. Patent No. 10,833,809 (the "'809 Patent"); U.S. Patent No. 8,595,577 (the "'577 Patent"); U.S. Patent No. 8,468,411 (the "'411 Patent"); U.S. Patent No. 10,044,473 (the "'4473 Patent")
The Family 10 Patents	U.S. Patent No. 9,154,354 (the "'354 Patent"); U.S. Patent No. 8,937,988 (the "'988 Patent")
The Transceiver Claims	Claims 17, 36, and 40 of the '686 Patent; claims 17, 18, 21, 23, 25, 26, 29, 31, 33, and 37 of the '881 Patent; claims 1, 9, 10, 11, 12, and 13 of the '193 Patent; claims 8, 9, 13, 14, 15, 16, 17, 18, and 21 of the '601 Patent; claims 1 and 3 of the '014 Patent; claims 9 and 13 of the '882 Patent; claims 1 and 5 of the '048 Patent; claims 10 and 28 of the '5473 Patent; claims 1, 2, 3, and 4 of the '608 Patent; claims 21 and 22 of the '510 Patent; claim 14 of the '008 Patent; claims 8 and 24 of the '835 Patent; claims 8, 10, 11, 12, and 14 of the '112 Patent; claims 10, 11, 17, 18, 19, and 25 of the '411 Patent; claims 16, 30, 37, 38, 53, and 54 of the '577 Patent; claims 1, 3, 9, and 11 of the '348 Patent; claims 11, 17, and 19 of the '055 Patent; claims 1 and 3 of the '4473 Patent; claims 1, 3, 4, 6, 8, 10, 11, 13,

Abbreviation	Term
	15, 17, 18, 20, 22, 25, and 27 of the '809 Patent; claims 10-12 of the '354 Patent; claim 16 of the '988 Patent
The Operable To / Configurable To Claims	Claims 1, 9, and 13 of the '193 Patent; claims 8, 14, and 21 of the '601 Patent; claim 1 of the '014 Patent; claims 1 and 4 of the '608 Patent; claims 21 and 22 of the '510 Patent; claim 8 of the '112 Patent; claims 16, 30, 37, 38, 53, and 54 of the '577 Patent; claims 1, 3, 9, and 11 of the '348 Patent; claim 11 of the '055 Patent; claims 1 and 3 of the '4473 Patent; claim 10 of the '354 Patent; claim 16 of the '988 Patent

TQ Delta asserts constructions that inappropriately inject limitations into the terms or limit the claims to particular embodiments. In a number of places, TQ Delta takes positions that are contrary to positions it took in litigation it brought on the same patents, and contrary to the constructions that the court ordered in that litigation. TQ Delta is estopped from asserting these positions, and they should not be adopted. *See Love v. Tyson Foods, Inc.*, 677 F.3d 258, 261 (5th Cir. 2012). In contrast, Defendants assert constructions that are consistent with the intrinsic evidence, the understanding of a POSITA, and the lexicography in the Asserted Patents.

The Asserted Patents span seven families, and the parties refer to the families by the nomenclature used in the co-pending Delaware Cases that TQ Delta has filed against other defendants: Families 1, 2, 3, 4, 6, 9, and 10. Defendants address the terms for each family in turn.

I. AGREED CONSTRUCTIONS

Defendants disagree with TQ Delta's statement regarding agreed constructions. *See* TQD Br. at 2. As stated in the parties' Joint Claim Construction and Prehearing Statement, the parties do not presently have agreed claim constructions. Dkt. 107 at 2. In particular, there appears to be a dispute between the parties regarding the plain and ordinary meaning of the term "specifying a maximum number of bytes of memory that are available to be allocated to [a/an interleaver/deinterleaver]" in claims 9 and 13 of the '882 Patent and claims 1 and 5 of the '048 Patent. Defendants' proposed construction of "plain and ordinary meaning" requires that the message transmitted or received during initialization *actually specifies a maximum number of bytes* of memory available to be allocated. This interpretation is consistent with the language of the claims and the specification. '882 Patent at 8:60–9:4. Additionally, while TQ Delta's brief is unclear, TQ Delta's Infringement Contentions indicate that TQ Delta takes a broader position that reads out the requirement—stated directly in the claim term itself—that the message specify the *maximum number of bytes*. *See, e.g.*, '882 Patent Claim Chart for Nokia at 3–5. Thus, this is a

case where merely adopting “the ‘ordinary’ meaning of a term does not resolve the parties’ dispute, and claim construction requires the court to determine what claim scope is appropriate in the context of the patents-in-suit.” *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008). Thus, Defendants respectfully request that the Court enter a construction for the term “specifying a maximum number of bytes of memory that are available to be allocated to [a/an interleaver/deinterleaver]” as “plain and ordinary meaning, where the message must specify a maximum number of bytes.”

II. ARGUMENT

A. Terms in Multiple Patent Families

i. “Transceiver” (All Families)¹

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning, which is: “communications device capable of transmitting and receiving data wherein the transmitter portion and receiver portion share at least some common circuitry.”	Plain and ordinary meaning, which is: “communications device capable of transmitting and receiving data”

The parties agree that a “transceiver” is a “communications device capable of transmitting and receiving data,” but TQ Delta’s proposed construction adds an additional requirement—that “the transmitter portion and receiver portion share at least some common circuitry.” There is no basis in the intrinsic record for this restriction, and there is no evidence of disclaimer or lexicography to support it.

Defendants’ proposed construction is correct because each of the relevant patent specifications discloses that the claimed transceivers must be capable only of both transmitting and receiving data—and nothing more. *See, e.g.*, ’686 Patent (Family 1) at 1:54-60 (“[e]ach modem includes a transmitter section for transmitting data and a receiver section for receiving

¹ This term appears in the Transceiver Claims. *See* Table of Abbreviations.

data”). There is no language in either the claims or the specifications suggesting that the transmitter or receiver must share (undefined) common circuitry. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005). In support of its proposed construction requiring shared common circuitry, TQ Delta relies only on extrinsic evidence in the form of two dictionary definitions, which is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.* at 1318. Notably absent is any support for its construction within the intrinsic record.

Defendants recognize that the Delaware court previously construed the term “transceiver” consistent with TQ Delta’s proposed construction here. Family 1 CC Mem. Op. at 4. Nokia was not a party to those cases, and thus cannot be bound by the Delaware court’s construction. In any event, the Delaware construction is inconsistent with this Court’s previous construction of the same term. In *Wi-LAN Inv. v. HTC Corp.*, this Court construed “transceiver” to mean “a device that transmits and receives data.” No. 2:11-CV-68-JRG, 2013 U.S. Dist. LEXIS 52117, at *17 (E.D. Tex. Apr. 11, 2013). That construction is entirely consistent with Defendants’ proposed construction in this case. Dr. Cooklev also indicated that common circuitry is not a requirement, stating that “[t]ypically, the transmitter . . . and the receiver . . . share at least some common circuitry.” Cooklev Decl. at ¶ 27.² The Court should adopt Defendants’ construction.

ii. “Operable To” / “Configurable To” (Families 2, 3, 6, 9, and 10)³

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning, which is: “able to be configured” / “capable” / “capable to”	Plain and ordinary meaning, not mere capability

The terms “operable to” and “configurable to” should be construed to have their plain and ordinary meaning, which does not encompass mere capability. These terms require structure that

² Emphasis added unless otherwise noted.

³ These terms appear in the Operable To / Configurable To Claims. *See* Table of Abbreviations.

presently is “operable to” or “configurable to” perform the stated tasks, not merely capable of being *modified* to do so.

Consistent with Defendants’ proposed construction, in the Delaware Cases, the court construed the term “configurable to” (and the related term “configured to”) as requiring more than mere capability. The court defined them as “includ[ing] the necessary hardware and software for performing the functionality recited in the claim without the need to rebuild, rewrite or recompile the code for, or redesign any of the hardware or software.” ADTRAN Case, 2021 U.S. Dist. LEXIS 60151, at *10 (D. Del. Mar. 30, 2021); Family 2 CC Mem. Op. at 12. Similarly, the court construed “operable to” consistent with the defendants’ proposed construction as “in operation to,” which does not encompass mere capability. In particular, the court held that “operable to” requires “actual operation.” ADTRAN Case, 2019 U.S. Dist. LEXIS 153622, at *11 (D. Del. Sept. 10, 2019).

This Court has construed the similar term “configured to” several times to have this same construction. *See, e.g., Huawei Techs. Co. v. Verizon Comm’cns*, No. 2:20-cv-00030-JRG, 2021 U.S. Dist. LEXIS 7944, at *60 (E.D. Tex. Jan. 15, 2021); *Sipco, LLC v. Amazon.com, Inc.*, No. 2:08-CV-359-JRG, 2012 U.S. Dist. LEXIS 150940, at *147 (E.D. Tex. Oct. 19, 2019); *Solocron Media, LLC v. Verizon Comm’cns Inc.*, No. 2:13-cv-1059-JRG-RSP, 2015 U.S. Dist. LEXIS 26681, at *36 (E.D. Tex. Mar. 5, 2015) (construing “configured to” to have its plain meaning, “which the Court understands to require not merely being capable of being configured but rather being actually configured”).

TQ Delta’s overbroad proposal, by comparison, seeks to encompass any structure that could be modified to meet the claim language. For example, TQ Delta suggests that the claim language requiring transceivers to be “operable as bonded transceivers” would, under TQ Delta’s

proposal, include “[a] transceiver that contains the capability to be bonded with another transceiver.” TQD Br. at 4. That view would effectively allow unbonded transceivers to qualify as bonded transceivers because one could *modify* them to be bonded. TQ Delta offers no intrinsic evidence in support of that construction. TQ Delta relies on the Federal Circuit’s decisions in *Finjan* and *Fantasy Sports*, but they did not deal with the relevant terms here, “configurable to” and “operable to.” Rather, those cases addressed infringement of “a claim that recites capability and not actual operation,” whereas here the claims do not encompass mere capability. *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1205 (Fed. Cir. 2010); *see also Fantasy Sports Props. v. Sportsline.com, Inc.*, 287 F.3d 1108, 1118 (Fed. Cir. 2002). The terms at issue here require “actual operation,” just as the Delaware court previously held, and consistent with this Court’s construction of similar terms.

B. Family 1 Terms

i. “Each Bit In The Diagnostic Message Is Mapped To At Least One DMT Symbol”⁴

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“each bit in the diagnostic message is communicated using a modulation scheme where a DMT symbol (or two or more DMT symbols) represents only a single bit of the diagnostic message”	Indefinite

This term is indefinite. As described in Dr. McNair’s declaration, a POSITA would not understand the meaning of the phrases “mapped” or mapped to “at least one” and “one” as used in the asserted limitation. McNair Decl. at ¶¶ 44-57. Specifically, as Dr. McNair explains, this language is subject to any number of interpretations, resulting in confusion as to what is intended. *See, e.g., id.* at ¶ 46 (“Specifically, the term ‘mapped’ could mean that the same bit value is

⁴ This term appears in claims 17, 36, and 40 of the ’686 Patent.

represented by one symbol, two symbols, or every symbol that results from a given DMT signal. A person of skill in the art would understand that you have to define a mapping function with specificity in order to implement that particular function.”). Accordingly, because this term is not “precise enough to afford clear notice of what is claimed,” it is indefinite. *Nautilus, Inc. v. Biosig Instruments*, 134 S. Ct. 2120, 2129 (2014).

In addition to the claim language itself, the specification confirms the ambiguity of the term. For example, the specification contains a single description of the term “mapped”: “In the one bit per DMT symbol modulation message encoding scheme, a bit with value 0 is mapped to the REVERB1 signal and a bit with a value of 1 is mapped to a SEGUE1 signal.” ’686 Patent at 3:54-57. But this language references mapping to a particular *signal*, not a *symbol*, and provides no insight as to what it means to map a bit of the diagnostic message to a symbol. Additionally, the claim’s use of the language “at least one DMT symbol” necessarily includes mapping to multiple DMT symbols. A POSITA would not understand how a bit in a message could be “mapped” to more than one DMT symbol. McNair Decl. at ¶ 50. Indeed, as described above, the discussion within the specification of the “one bit per DMT symbol modulation scheme,” ’686 Patent at 3:54-57, does not disclose that any particular bit is mapped to more than one DMT symbol or how that would be accomplished. Thus, the language of the patent itself raises a number of questions in the mind of a POSITA, such as (1) whether there is some error coding used to map a bit into several redundant symbols, (2) whether the same bit is sent multiple times, once in each symbol, or (3) whether the claim language contemplates something else entirely. McNair Decl. at ¶ 50.

ii. “Array Representing Frequency Domain Received Idle Channel Noise Information”⁵

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“ordered set of values representative of noise in the frequency domain that was received by a transceiver on respective subchannels in the absence of a transmission signal on the received channel”	“array of values representative of noise in the frequency domain that was received by a transceiver on respective subchannels in the absence of a transmission signal”

TQ Delta’s proposed construction attempts to read language into the claim where it is unnecessary to do so. First, as other courts have recognized, “array” is a commonly accepted term of art and need not be further construed. *See, e.g., Foremost in Packaging Sys. v. Cold Chain Techs.*, No. SACV 05-24-JVS(MLGx), 2005 U.S. Dist. LEXIS 50721, at *10 (C.D. Cal. Nov. 21, 2005). Here, the specification—written for skilled artisans—uses the phrase “arrays with different lengths” without elaborating on the term “array,” indicating that a POSITA understands the term. ’686 Patent at 4:38-42. Notably, there is no record support for restricting the claimed “array” to an “ordered set” of values as TQ Delta proposes.

With respect to the phrase “in the absence of a transmission signal” (common to the parties’ proposed constructions), there is no basis to limit the phrase to “the received channel” as TQ Delta proposes. This term is easily understood to refer to noise received by a transceiver when that transceiver’s “received” channel is idle, *i.e.*, when the transceiver is not receiving a transmission signal. TQ Delta’s proposed addition of “on the received channel” is contrary to the specification. A transmission signal is produced by combining multiple carrier signals (each associated with a subchannel) and is transmitted by a remote transmitter and received by the claimed transceiver only as a whole. *See* ’686 Patent at 1:34-43, 2:1-11. Therefore, for a channel to be idle, as required by the claim, the transceiver must be “off.” But TQ Delta’s proposed construction would permit

⁵ This term appears in claims 17, 36, and 40 of the ’686 Patent.

an interpretation that, despite the transmitter being “off” (and therefore not transmitting), a transmission signal could be received on some channels but be absent for others.

C. Family 2 Terms

i. “Plurality Of Bonded Transceivers”⁶

TQ Delta’s Proposed Construction	CommScope’s Proposed Construction
“two or more transceivers located on the same side of two or more physical links where each transceiver is configurable to transmit or receive a different portion of the same bit stream via a different one of the physical links”	“two or more transceivers, located on the same side of two or more physical links and each corresponding to one of the physical links, coordinated to transmit or receive a different portion of the same bit stream via a different one of the physical links”

The dispute over this term is very simple—CommScope seeks a construction that reflects the claim language that applicants chose to use, while TQ Delta attempts to broaden that language to capture the accused devices. The applicants could have chosen language such as a “plurality of transceivers capable of being bonded,” but they did not. TQ Delta should not now be permitted to rewrite the claim. *See Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004).

Although the term “bonded transceivers” only appears in the claims, the specification uses the term “bonded” in a manner consistent with CommScope’s proposed construction. For example, the specification states that “[t]he exemplary systems and methods of this invention **combine** multiple DSL PHY’s, *i.e.*, multiple twisted wire pairs, to, for example, **generate a high data rate connection for the transport of an ATM cell stream** between the service provider and, for example, a DSL subscriber.” ’881 Patent at 1:60-64. The specification later states that “two ADSL PHYs 160 and 170 are ‘bonded’ together to transport a single ATM cell stream.” *Id.* at 4:29-31. As the physical layer, or PHY, is a conceptual layer within an ADSL transceiver, the

⁶ This term appears in claims 17, 18, 21, 23, 25, 26, 29, 31, 33, and 37 of the ’881 Patent. The ’881 Patent is asserted against CommScope only.

specification clearly describes “bonded transceivers” as transceivers coordinated to combine two lines together to form a single high data rate ATM cell stream.

TQ Delta asserts that its proposed construction is consistent with Federal Circuit law because “[a]n apparatus claim covers ‘what a device *is*, not what a device *does*.’” TQD Br. at 9. However, TQ Delta ignores that the so-called “apparatus” of the claims is not described by any structure or components; rather, it is simply described as “bonded transceivers” performing functions. Unlike TQ Delta’s proposed construction, CommScope’s proposed construction reflects the critical concept that the transceivers must actually do something, *i.e.*, be bonded to transmit different portions of the same bit stream. *See Typhoon Touch Tech. Inc. v. Dell Inc.*, 659 F.3d 1376, 1380-81 (Fed. Cir. 2011) (affirming claim construction that required a memory to actually perform a recited function as opposed to merely being “configured to” perform it).

ii. “Reduce A Difference In Latency Between The Bonded Transceivers”⁷

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction⁸
“reduce a difference in configuration latency”	Indefinite, or, if not indefinite, “minimize the difference in the configuration latencies between the bonded transceivers”

The intrinsic record fails to inform, with reasonable certainty, those skilled in the art about the scope of this claim term, and therefore the term should be found indefinite. While the specification of the Family 2 Patents identifies characteristics that contribute to latency, the intrinsic record fails to inform a POSITA about the scope of the requirement to “reduce a difference in latency.” The specification states that there can be a “latency difference,” and it describes various types of latencies, but it never explains how to “reduce a difference in latency” as the claim

⁷ This term appears in claims 17, 25, 26, 29, 31, 33, and 37 of the ’881 Patent.

⁸ Nokia only proposes that this term is indefinite. CommScope sets forth the alternative construction in the chart above and as briefed below.

requires. *See, e.g.*, ’881 Patent at 6:5–31 (describing “exemplary” latency differences as including but not limited to “configuration latency,” “ATM-TC latency,” “[w]ire latency,” and “[d]esign latency”).⁹

As TQ Delta rightly acknowledges, the claims require “utilizing at least one transmission parameter value . . . to reduce a difference in latency between the bonded transceivers.” TQD Br. at 10 n.7. TQ Delta then points to the specification’s use of buffers for dealing with delay as support that the “claimed ‘reduction’ can relate to what the latency difference would have otherwise been in the absence of transmission parameters.” TQD Br. at 11. That argument is flawed. The specification’s discussion of “buffers” addresses a completely different embodiment than what is claimed. In particular, the specification provides that, in one embodiment, one way to deal with the difference in latencies between two lines is to just store the data from the line that is received first in a buffer until the data from the second line arrives. ’881 Patent at 6:36-55 (“*the multi-pair multiplexing receiver 500 can simply wait* until, for example, cell number 1 comes in path number one, while path number two will buffer cell number 2 and wait for cell number 1 to be received”). In this embodiment, the latency between the two lines is not reduced at all; rather, one line is simply held up while waiting for data on the other line to arrive. Thus, the discussion of buffers does not indicate that the patent considers comparing latency between a system with and a system without transmission parameters.

Further, the only potentially relevant disclosure regarding a means to “reduce the difference in latency” is through adjusting the configuration latency. ’881 Patent at 6:66-7:34. But simply reducing the difference in *configuration latency* is not sufficient to reduce the overall difference

⁹ Throughout, where the patents of a particular family share a common specification, Defendants cite to only one patent for brevity.

in latency *of the system*. For instance, as Dr. Zimmerman explained, a POSITA would recognize that “it is possible to *increase* the difference in overall latency between two links by *reducing* the difference in configuration latency. Where one link’s wire latency is 10x greater than the second, utilizing transmission parameters to only reduce a difference in *configuration* latency could exacerbate the difference in overall latency, or leave it unchanged (*i.e.*, by bringing the configuration latencies close to one another, the 10x wire latency difference remains unresolved).” Zimmerman Decl. at ¶ 61. Because the claims and specification do not provide any guidance, and the prosecution history fails to resolve this issue, *see* Zimmerman Decl. at ¶ 62, the limitation “to reduce a difference in latency” lacks any certainty as to its meaning or scope, let alone reasonable certainty, and therefore is indefinite.

Alternatively, if this claim term is not indefinite, the Court should adopt CommScope’s proposed construction because it is consistent with the specification.¹⁰ TQ Delta points to the disclosure of “buffers” to argue that the difference in configuration latencies between bonded transceivers does not have to be minimized. TQD Br. at 11-12. As discussed above, the patent’s discussion of buffers does not address the claimed embodiment and is therefore irrelevant.

In contrast, the claimed embodiment is described as an “effective method of reducing the difference in latency between DSL PHYs.” ’881 Patent at 6:56-59. The specification teaches that the configuration latency can be reduced by configuring the transmission parameters of the transceivers. *Id.* Thus, the only embodiment potentially disclosed that “reduces” the difference in *configuration* latency between two bonded transceivers is configuring the transmission parameters, such as data rate and interleaver depth, so that the data from the two lines arrive at the

¹⁰ To be clear, as explained above, Defendants disagree that the specification refers to “a difference in latency” as “a difference in configuration latency.” But assuming *arguendo* that the referenced “latency” is “configuration latency,” CommScope’s alternative construction should be adopted.

receiving transceiver at as close to the same time as possible. Where, as here, the specification discloses only a single embodiment potentially relevant to configuration latency, it is appropriate to limit the claims to that embodiment. *See, e.g., Wi-LAN USA, Inc. v. Apple Inc.*, 830 F.3d 1374, 1382-83 (Fed. Cir. 2016). Additionally, TQ Delta’s proposed construction is nonsensical, as a difference between two things cannot be “reduced” without knowing what the difference was originally.

D. Family 3 Terms

i. “Shared Memory”¹¹

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“common memory used by at least two functions, where a portion of the memory can be used by either one of the functions”	Plain and Ordinary Meaning

As an initial matter, TQ Delta incorrectly implies that arguments made by 2Wire in the Delaware litigation somehow limit Defendants in this case. TQD Br. at 12–13. Because neither Defendant was a party in the Delaware litigation, Defendants in this case should not be limited to positions taken by 2Wire.

TQ Delta’s proposed construction improperly narrows the claim language by injecting confusion into a term that was well known to a POSITA at the time of the invention, again without even attempting to support its construction with evidence of disclaimer or lexicography. *See* Wesel Decl. at ¶ 42. Specifically, TQ Delta’s construction improperly narrows the meaning of the term “shared memory” to a specific use of that shared memory—that is, where a portion of the memory can be used by either one of the functions. TQ Delta’s construction presupposes that a shared memory has been programmed so that multiple functions actually access the same location in the

¹¹ This term appears in claims 9 and 13 of the ’882 Patent; claims 1 and 5 of the ’048 Patent; claim 10 of the ’5473 Patent; claims 21 and 22 of the ’510 Patent; claim 2 of the ’608 Patent.

common memory. But there exist certain implementations of shared memory where the same portion of memory is never used by multiple functions. *See id.* at ¶¶ 43–44. For example, two functions can be assigned to a shared memory such that the functions use different memory spaces without ever using the same portion of the shared memory. *Id.* at ¶ 43. A POSITA would have understood that, even where the shared memory was programmed in such a way, the memory itself was still a shared memory. *Id.* at ¶¶ 43–44. Thus, contrary to TQ Delta’s assertion, Defendants are not asserting that “essentially all memory” is shared memory. TQD Br. at 13. Rather, Defendants are merely recognizing that a shared memory may be used in different ways, and that TQ Delta’s proposed construction contemplates only one of those ways—and the intrinsic evidence does not support TQ Delta’s attempt to narrow the plain meaning of the term.

Nor does Defendants’ interpretation of the term contradict what is disclosed in the claims or specification. Indeed, as TQ Delta acknowledged (TQD Br. at 13-14), the claims of the patents merely contemplate “allocating” an amount of memory to an interleaver or deinterleaver. *See, e.g.,* ’882 Patent at claims 1, 5, 9, 13. Nowhere do the claims require that the same portion of that memory be used by both the interleaver and deinterleaver. TQ Delta likewise fails to point to any lexicography or disclaimer in the specification that would limit a POSITA’s understanding of a shared memory to this specific implementation. In fact, TQ Delta’s citations to the specification—*e.g.,* describing that shared memory can “be designed to allocate a first portion of shared memory 120 to a first interleaver, *e.g.,* 216, in the transmitter portion of the transceiver and allocate a second portion of the shared memory to a second interleaver, *e.g.,* 226, in the transmitter portion of the transceiver,” *id.* at 5:40–46—are agnostic to whether a *single* portion of the memory can be used by either one of the functions. Thus, this is not a case where the patents have limited the meaning of the claim language beyond its plain and ordinary meaning. And the plain and ordinary meaning

is broader than that proposed by TQ Delta. Because TQ Delta has not met its burden to identify any disclaimer or lexicography, this term should be afforded its full plain and ordinary meaning.

ii. “Wherein The Generated Message Indicates How The Memory Has Been Allocated Between The [First Deinterleaving / Interleaving] Function And The [Second] Deinterleaving Function” / “A Message Indicating How The Shared Memory Is To Be Used By The Interleaver Or Deinterleaver”¹²

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary.	Plain and ordinary meaning, <i>i.e.</i> , “the message indicates the amount of memory [that has been allocated to / is to be used by] the [first deinterleaving / interleaving] function and the amount of memory [that has been allocated to / is to be used by] the [second] deinterleaving function”

As TQ Delta admits, in the Delaware litigation, ***TQ Delta proposed the construction now put forth by Defendants in this case.*** See TQD Br. at 14-15. TQ Delta does not appear to disagree with this construction, nor can it, given that it is estopped from doing so. See *Love*, 677 F.3d at 261; *Minn. Mining and Mfr’g Co. v. Chemque, Inc.*, 303 F.3d 1294, 1302-04 (Fed. Cir. 2002). Defendants’ proposed construction provides clarity to the claim language. At first blush, it is unclear exactly what the claims mean in reciting “how the memory has been allocated” or “how the shared memory is to be used.” But upon reading the claims in view of the specification, a POSITA would understand that the claims are referencing an indication of the ***amount of memory*** that is used. See Wesel Decl. at ¶¶ 47-49. This clarification would be helpful to the jury and is entirely consistent with the plain and ordinary meaning.

TQ Delta’s concern that Defendants may argue a different construction to the jury is unfounded. If such a concern is all that is keeping the parties from reaching agreement on this

¹² These terms appear in claims 10 and 28 of the ’5473 Patent.

helpful construction, Defendants agree not to assert that the meaning of this claim language is limited to indicating “a number of bytes of memory.”

E. Family 4 Terms

i. “Phase Characteristic(s)”¹³

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“one or more values that represent the angular aspect of a carrier signal”	Plain and ordinary meaning

TQ Delta’s construction improperly narrows the term “phase characteristic(s)” and should be rejected in favor of the plain and ordinary meaning of the term. TQ Delta argues that the specification teaches that “a phase characteristic of a carrier signal is a value (*e.g.*, the QAM symbol constellation points) that represents the angular aspect of the carrier signal.” TQD Br. at 16. But rather than provide clarity, TQ Delta’s construction simply risks confusing the jury, requiring explanation of QAM symbol constellation points and “angular aspects of a carrier signal.” Also, TQ Delta’s proposal is overly restrictive. Many “phase characteristics” may exist for a carrier signal, but TQ Delta’s construction limits those characteristics to values that “represent the angular aspect” of that carrier signal. *See, e.g.*, ADTRAN Case Markman Hearing Tr. (Mar. 18, 2021) at 19, 25 (counsel for TQ Delta representing that there may be “infinite” phase characteristics and that TQ Delta’s expert explained that “there are numerous ways that one skilled in the art would understand that a phase characteristic can be expressed”); *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1323-24 (Fed. Cir. 2018). TQ Delta’s construction should be rejected, and the term should be given its plain and ordinary meaning.

ii. “Substantially Scramble The Phase Characteristics Of The Plurality Of Carrier Signal”¹⁴

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
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¹³ This term appears in claim 14 of the ’008 Patent.

¹⁴ This term appears in claim 14 of the ’008 Patent.

“adjust the phase characteristics of the carrier signals by varying amounts to produce a transmission signal with a reduced peak to average power ratio (PAR)”	Plain and ordinary meaning
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TQ Delta’s construction should be rejected in favor of the plain and ordinary meaning. It is well established that importing functional language from the specification into a term’s construction is inappropriate. *See, e.g., Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1367 (Fed. Cir. 2001) (“[T]he fact that the claimed composition was designed to solve certain problems of the prior art . . . does not mean that we must attribute a function to the nonfunctional [claim language]. Where the function is not recited in the claim itself by the patentee, we do not import such a limitation.”); *Va. Panel Corp. v. Mac Panel Co.*, 133 F.3d 860, 866 (Fed. Cir. 1997). TQ Delta’s construction does just that, as it requires the functional result of—“produc[ing] a transmission signal with a reduced peak to average power ratio (PAR).” But TQ Delta provides no argument regarding disclaimer, disavowal, or lexicography to support its construction. The term should be given its plain and ordinary meaning.

iii. “Same Bit Value” / “Multiple Carrier Signals Corresponding To The Scrambled Carrier Signals Are Used By The First Multicarrier Transceiver To Modulate The Same Bit Value”¹⁵

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“same bit value” : “value of the same bit” “multiple carrier signals corresponding to the scrambled carrier signals are used by the first carrier first multicarrier transceiver to modulate the same bit value” : “a first carrier signal is used by the first multicarrier transceiver to demodulate the value of a bit of the received bit stream and at least one more carrier signal is used by the first multi carrier transceiver to demodulate the value of the same bit of the received bit stream, wherein the carrier	“same bit value” : Indefinite. “multiple carrier signals corresponding to the scrambled carrier signals are used by the first carrier first multicarrier transceiver to modulate the same bit value” : Indefinite.

¹⁵ These terms appear in claim 14 of the ’008 Patent.

signals correspond to the plurality of phase-shifted and scrambled carrier signals.”	
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Both of these terms refer to the “same bit value,” which is indefinite because a POSITA would not understand with reasonable certainty whether “same bit value” refers to the same bit position or instead refers to the same bit value as between 0’s and 1’s. *See* Zimmerman Decl. at ¶¶ 76-77. As discussed below, TQ Delta itself has taken inconsistent positions regarding this term, demonstrating that the term is indefinite: TQ Delta adopted the former construction (same bit position) in Delaware, but now proposes a different construction (value of the same bit).

A POSITA could interpret “same bit value” in those two, very distinct ways, according to the term’s usage in the specification. First, a POSITA could interpret “same bit value” to mean a particular bit in a series of bits, *i.e.*, **a bit position**. *See* Zimmerman Decl. at ¶ 77. For example, the specification refers to the “same input data bits,” stating that an example of a case “where the phases of modulated carrier signals are not random [is] when . . . multiple carrier signals are used to modulate the same input data bits.” ’008 Patent at 2:16-19. A provisional application to which the Family 4 Patent claims priority also refers to this concept in terms of “**same data bits**” rather than “**same bit value**.” ’134 Provisional at 1-2 (stating that improving phase randomization would be needed where “[t]he same data bits are used to modulate multiple carriers. This would occur in cases where it was desired (or required) to send the same data bits on different carriers and then combine the results at the receiver in order to receive the bits at a lower Bit Error Rate (this is a well-known method for using frequency diversity to decrease the BER).”). A POSITA would understand both of these passages, which detail the problem the invention purportedly addresses, to mean repeating a portion of a bit stream on multiple carriers or, equivalently, modulating the same bit position in a series of bits onto multiple carriers. *See* Zimmerman Decl. at ¶ 77.

But the specification repeatedly uses the actual claim language “bit value” to refer to 0’s and 1’s, as opposed to bit position. *See* Zimmerman Decl. at ¶ 78. For example, the specification discusses selecting a value for use in computing the phase shift independently of “the bit value(s) modulated onto the carrier signal,” *i.e.*, independently of the value of the bit as 0 or 1. *See* ’008 Patent at 4:50-53; *see also id.* at 5:2-4, Abstract, 2:39-40.

The different meanings used in the specification create uncertainty over claim scope, and the prosecution history does not provide any guidance either. *See* Zimmerman Decl. at ¶¶ 79, 80. In the first meaning, the claim scope would be limited to instances where specific portions of a bit stream are modulated on multiple carriers. But the meaning of “bit value” generally described in the specification results in a much broader claim scope. Because the value of a bit can only be 0 or 1, once there are three or more carriers carrying only a single bit, at least two of them will be modulated by the same bit value (0 or 1). Thus, if “same bit value” is interpreted to refer to the value of the bit (0 or 1), the claim scope is broadened to include essentially any transmission. *See Id.* at ¶ 79.

TQ Delta’s construction does nothing to clarify the term. Incredibly, TQ Delta appears to argue that the term “same bit value” should be accorded the second understanding described above, which, as explained, would cover essentially any transmission. *See* TQD Br. at 18 (“Those of skill in the art would have understood that the term ‘same bit value’ refers to the ‘value of the same bit.’ . . . The Patents solve this problem by utilizing a phase scrambler to shift the phases of the carriers for the same bit values (*e.g.*, the bit values that cause the peak) to reduce the PAR of the signal, which reduces the likelihood of clipping and excess power consumption.”). Yet in the Delaware litigation, *TQ Delta itself* interpreted “same bit value” according to the first understanding described above, *i.e.*, “same bit position.” *See* TQD Delaware Family 4 Br. at 64.

TQ Delta even argued in the Delaware litigation, inconsistent with its position here, that the second understanding is “unreasonably broad and would render the entire term superfluous.” *Id.* at 65. Accordingly, the term fails to inform those of ordinary skill in the art about the scope of the invention with reasonable certainty, and thus the Court should hold the term indefinite.

iv. “Computing A Phase Shift For Each Carrier Signal”¹⁶

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary.	“computing the amount by which a phase is adjusted for each carrier signal”

Defendants’ construction clarifies the term “phase shift” for the jury by explaining, consistent with the specification, that it is the “amount by which a phase is adjusted” for each carrier signal. *See, e.g.,* ’008 Patent at 6:41-46 (“The DMT transmitter 22 then computes . . . the phase shift ***that is used to adjust*** the phase characteristic of each carrier signal. ***The amount of the phase shift*** combined with the phase characteristic of each QAM-modulated carrier signal depends upon the equation used and the one or more values associated with that carrier signal.”). TQ Delta’s briefing confirms the need for this construction, which the Delaware court adopted. *See* TQD Br. at 19-20 (citing Family 4 CC Mem. Op. at 17-18). TQ Delta asserts that the term’s “plain language can encompass simply computing the fact that a phase shift exists.” *Id.* at 19. It is unclear what TQ Delta means, but regardless that is not what the term says. It does not say to compute the existence of a phase shift; it says to “comput[e] a phase shift.” The correct construction, consistent with the intrinsic record and the Delaware court’s construction, is “computing the amount by which a phase is adjusted for each carrier signal.”

v. “Combining The Phase Shift Computed For Each Respective Carrier Signal With The Phase Characteristic Of That Carrier Signal”¹⁷

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
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¹⁶ This term appears in claim 14 of the ’008 Patent.

¹⁷ These terms appear in claim 14 of the ’008 Patent.

Plain and ordinary meaning. No construction necessary.	“adjusting the phase of each carrier signal by an amount computed for that carrier signal”
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The parties agree that this term and the prior term should be construed similarly. *See* TQD Br. at 20. For the same reasons described above, the Court should adopt Defendants’ construction.

F. Family 6 Terms

i. “Steady-State Communication”¹⁸

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“Showtime”	“the state of the transceiver reached after all initialization and training is completed in which user data is transmitted or received”

Defendants’ proposed construction is consistent with the plain and ordinary meaning of the term “steady-state communication,” while TQ Delta’s construction limits the term to an example embodiment in the specification. *See* TQD Br. at 20-21 (citing ’162 Patent at 2:41-47); *WesternGeco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1323-24 (Fed. Cir. 2018). The specification does not limit “steady-state communication” to only “Showtime.” Rather, the specification explains that “steady-state communication” may be consistent with “Showtime” *for DSL technologies*, but the claims are not limited to DSL technologies. *See, e.g.*, ’835 Patent at 4:3-7 (explaining that a process can be done in “steady-state transmission, *i.e., Showtime for DSL systems*”). The specification describes “steady-state communication” consistently with Defendants’ construction as “the state of the transceiver reached after all initialization and training is completed in which user data is transmitted or received.” *See, e.g.*, ’835 Patent at 4:19-31 (explaining that steady-state transmission occurs when “user information is transmitted,” and contrasting the “new initialization state” with “steady-state transmission”); 4:3-7 (explaining that steady-state transmission occurs when user information bits are transmitted). The Court should

¹⁸ This term appears in claim 8 of the ’112 Patent; claims 8 and 24 of the ’835 Patent.

adopt Defendants’ construction, which is the same as the Delaware court’s construction. Family 6 CC Order at 2.

ii. “Flag Signal”¹⁹

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“signal used to indicate when an updated FIP setting / interleaver parameter value is to be used (the signal does not contain message data indicating when the updated FIP setting / interleaver parameter value is to be used)”	“signal used to indicate when updated FIP settings / interleaver parameter values are to be used”

TQ Delta’s construction adds a negative limitation that finds no support in the specification. TQ Delta proposes that the term “flag signal” be construed such that the signal “does not contain message data indicating when the updated FIP setting / interleaver parameter value is to be used” and, instead, is artificially limited to an empty symbol that does not contain message data. TQ Delta states (with no support) that its proposed negative limitation “clarifies what the affirmative construction already states—that a flag signal is different from message data.” TQD Br. at 21. But the affirmative construction is not limiting in this manner at all. TQ Delta points to intrinsic evidence showing that the specification uses both terms, “message” and “flag signal”—see TQD Br. at 21 (citing ’835 Patent at Fig. 6, 19:14-30, and 11:66-12:24)—but TQ Delta does not point to anything in the specification that arises to disclaimer or lexicography as to “flag signal.” TQ Delta’s construction should be rejected. *See Mass. Inst. of Tech. v. Shire Pharm., Inc.*, 839 F.3d 1111, 1118 (Fed. Cir. 2016).

iii. “FIP Setting” and “FIP Value”²⁰

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary.	FIP Setting: “forward error correction and interleaver parameters characterized by the set of parameters for codeword size in bytes, number of information bytes in a codeword,

¹⁹ This term appears in claims 8 and 24 of the ’835 Patent; claims 8 and 9 of the ’162 Patent.

²⁰ These terms appear in claims 8, 10, 24, and 26 of the ’835 Patent; claim 8 of the ’112 Patent.

	<p>number of parity or redundancy bytes in a codeword, and interleaver depth in number of codewords”</p> <p>FIP Value: “numerical value of codeword size in bytes, number of information bytes in a codeword, number of parity or redundancy bytes in a codeword, or interleaver depth in number of codewords”</p>
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The term “FIP Setting” did not have a generally understood meaning at the time of the alleged invention. McNair Decl. at ¶ 57. Although a POSITA “would have generally understood the processes of forward error correction encoding and interleaving to be governed by certain parameters, a POSITA would have been unfamiliar with the particular initialism ‘FIP’ as used in the Family 6 Patents.” McNair Decl. at ¶ 58. The Family 6 Patents define “FIP Settings” as “FEC and Interleaving Parameter (FIP) settings.” ’835 Patent at 3:31-34. Because the Family 6 Patents specifically define the term “FIP,” “a person of ordinary skill in the art would have understood the Family 6 Patents to be referring to particular FEC and interleaving parameters as explained in the Family 6 Patents.” McNair Decl. at ¶ 58.

The Family 6 Patents define the FIP Settings to be comprised of the parameters N, K, R, and D, which the Family 6 Patents define as “the codeword size in bytes,” “the number of information bytes in a codeword,” “the number of parity (or redundancy) bytes in a codeword,” and “the interleaver depth in number of codewords,” respectively. ’835 Patent at 1:65-2:18; *see also* McNair Decl. at ¶ 59. Because the Family 6 Patents define “FIP Settings” as the N, K, R, and D parameters with particular definitions in the specification, the Court should construe the term consistent with Defendants’ proposed construction. *See, e.g., Irdeto Access, Inc. v. EchoStar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004) (if a term “lacks an accepted meaning the art,” it should be construed “only as broadly as provided for by the patent itself”).

TQ Delta provides no justification for its plain-and-ordinary-meaning construction beyond citing the Delaware court’s opinion on this term. That court incorrectly held that an extrinsic standard referenced in the Family 6 Patents shows that the FIP Settings may comprise additional parameters other than the N, K, R, and D parameters. Family 6 CC Mem. Op. at 12; *see, e.g., Zenon Envtl., Inc. v. U.S. Filter Corp.*, 506 F.3d 1370, 1378-79 (Fed. Cir. 2007). Because the term “FIP Settings” was unfamiliar to a POSITA at the time of the Family 6 Patents, and particularly because the Family 6 Patents specifically define the term, the Court should adopt Defendants’ construction. The parties agree that the issues regarding “FIP setting” and “FIP value” are substantially similar and that the terms should be construed consistently. *See* TQD Br. at 23-24.

i. “Interleaver Parameter Value”²¹

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary.	“the numerical value of the interleaver depth in number of codewords”

Similar to “FIP Setting,” “interleaver parameter value” was not a term of art at the time of the alleged invention and did not have a generally understood meaning. *See* McNair Decl. at ¶¶ 57, 60. Accordingly, a POSITA would have looked to the specification of the Family 6 Patents to understand the term “interleaver parameter value,” which defines the term as “interleaver depth in number of codewords.” ’162 Patent at 2:10-22, 3:33-49, 13:43-47. A POSITA would thus understand that, “among the defined FIP values, the value relevant to an interleaver parameter value is a numerical value associated with interleaver depth, which as defined in the Family 6 Patents is ‘interleaver depth in number of codewords.’” McNair Decl. at ¶ 61. The Family 6 Patents define no other units for interleaver depth other than codewords. *Id.* Because the Family 6 Patents define the terms FIP Settings and FIP Values (as discussed earlier), the corresponding

²¹ This term appears in claims 10 and 26 of the ’835 Patent; claim 8 of the ’162 Patent.

term “interleaver parameter value” should be construed consistent with its disclosed scope in the specification. *See Irdeto Access*, 383 F.3d at 1300.

G. Family 9 Terms

i. “Higher Immunity To Noise”²²

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
“higher SNR Margin”	Plain and ordinary meaning

TQ Delta’s proposed construction improperly narrows the claim language in a manner inconsistent with its plain meaning. Wesel Decl. at ¶ 57. This term relates to messages communicated as positive or negative acknowledgements of received packets. ’809 Patent at 14:60-16:67; *see also* Wesel Decl. at ¶ 58. In connection with the communication of such messages, the patents disclose that “[s]ince the channel *has a limited data rate and is not necessarily error-free*, it is important to make sure that these messages are as robust as possible and consume the least amount of data rate.” ’809 Patent at 15:58-61; *see also* Wesel Decl. at ¶ 59. The patents then identify “several ways these requirements can be addressed,” including “repeating transmission of each message a number of times,” sending at least one repeated message in one or more multi-tone (“DMT”) symbols, sending a single message for multiple packets that “include[s] multiple packet count values,” and/or operating “the DMT sub-carriers that modulate these messages ... with a much higher SNR [signal-to-noise ratio] margin, e.g., 15 dB, as compared to the normal 6 dB margin of xDSL systems.” ’809 Patent at 15:55-16:67; *see also* Wesel Decl. at ¶ 60. In light of these disclosures, a POSITA would have understood that each of these ways could be used alone or in combination with the other ways. Wesel Decl. at ¶ 61.²³

²² This term appears in claims 2 and 9 of the ’348 Patent; claims 1, 9, 16, 23 of the ’809 Patent.

²³ Moreover, the specification introduces each of these examples with the language “[a]lternatively, or in addition,” and thus expressly recognizes that each of these ways may be used individually or in combination with one another. ’809 Patent at 15:55-16:67.

In support of its construction, TQ Delta cites only a single passage from the specification, and that passage itself makes clear that a higher SNR margin is just one “alternative[]” (or an “addition”) to other contemplated ways of achieving a higher immunity to channel noise. TQD Br. at 25 (citing ’348 Patent at 16:4-9). TQ Delta provides no reason why the term should be limited to just one example (among several) referenced in the specification. *Beneficial Innovations, Inc. v. Blockdot, Inc.*, No. 2:07-cv-263, 2010 WL 1441779, at *10 (E.D. Tex. Apr. 12, 2010).

*ii. The “Using” Terms*²⁴

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary	Indefinite

The “using” terms are indefinite, as a POSITA would not understand, with reasonable certainty, the scope of transmitting or receiving data *using* an interleaver or deinterleaver. This is because interleaving and deinterleaving functionalities do not actually transmit or receive data; rather, the transmitter transmits and the receiver receives data using hardware components, such as digital-to-analog or analog-to-digital converters, amplifiers, and antennas. Prior to being transmitted, data can be interleaved by an interleaver to spread out the symbols of each codeword. The data, however, is not transmitted using the interleaver functionality. After the data is received, it can be made available to a deinterleaver for deinterleaving. Deinterleaving then returns the symbols to their original pre-interleaving order so that they can be properly understood by the error correction and/or error detection decoders. Wesel Decl. at ¶ 51. The data, however, is not received using the deinterleaver functionality. As Dr. Cooklev admitted at his deposition, the interleaver

²⁴ These terms appear in claims 16, 30, 38, and 54 of the ’577 Patent; claims 1, 3, 9, and 11 of the ’348 Patent; claims 1 and 3 of the ’4473 Patent; claims 1, 3, 8, 10, 15, 17, and 22 of the ’809 Patent.

reorders bytes, and the transmitter transmits the interleaved stream of bytes to the receiver, which then makes that reordered sequence of bytes available to the deinterleaver for deinterleaving. *See* Cooklev Dep. Tr. at 35:11-36:11.

TQ Delta’s argument that the language of the claims and the specification support its position is incorrect. TQD Br. 26. Those claims and specification excerpts merely repeat the illogical proposition of transmitting/receiving using an interleaver/deinterleaver, which, as discussed above, does not sufficiently inform a POSITA about the scope of the term.

iii. “Receive At Least One Message Without Using Interleaving”²⁵

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary	Indefinite

This term is indefinite, as a POSITA would not understand with reasonable certainty what it means to *receive* a message without using interleaving. In addition to the reasons discussed in the previous section, this term is indefinite because interleaving is an operation that occurs only at the *transmitter* portion of the transceiver. Wesel Decl. at ¶ 50. Transceivers employ a variety of techniques to improve the reliability of data transmission, including forward error correction, retransmission, and interleaving/deinterleaving. *Id.* at ¶ 51. Each such technique requires a function to be performed at the transmitter portion of the transceiver at one end of the connection, and a corresponding but distinct function to be performed at the receiver portion of the transceiver at the other end of the connection. *Id.* For interleaving/deinterleaving, the interleaving operation is performed only at the transmitter portion and not at the receiver portion. *Id.* at ¶ 52. Likewise, the deinterleaving operation is performed only at the receiver portion and not at the transmitter portion, as confirmed by the specification. *Id.* at ¶¶ 52-54; ’809 Patent at 9:66-10:07.

²⁵ This term appears in claims 37 and 53 of the ’577 Patent.

As a result, a claim where the receiver receives a packet using interleaving, or conversely, where the transmitter transmits a packet using deinterleaving, is meaningless to a POSITA. Wesel Decl. at ¶ 52. Similarly, as pertinent here a POSITA would not understand the meaning of *receiving* a message *without* using interleaving, as the ramification of that phrase is that interleaving could be used for receiving a message (even though interleaving is a function used only at the transmitter portion of the transmitter). Wesel Decl. at ¶ 56. Because a POSITA would not know the scope of what is meant by this disputed claim phrase, it is indefinite. *Id.* at ¶ 55.²⁶

H. Family 10 Terms

As an initial matter, claim 10 of the '354 Patent is directed to “*receiving*” bits on a different plurality of carriers with different SNR Margins. '354 Patent at 10:36-47. TQ Delta's opening claim construction brief cites irrelevant portions of the '354 Patent's description of the *transmission* of bits and bit allocation. TQD Br. at 27-28. Such disclosures in the specification do not inform a POSITA regarding the scope of the asserted claimed directed to “*receiving*” bits.

i. “A Multicarrier Communications Transceiver Operable To: Receive A Multicarrier Symbol Comprising A First Plurality Of Carriers”²⁷

TQ Delta's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. No construction necessary	Indefinite

This phrase is indefinite. As described in Dr. Zimmerman's declaration, a POSITA would not understand the meaning of “a multicarrier symbol comprising a first plurality of carriers” and a second plurality of carriers. Zimmerman Decl. at ¶¶ 83-86. A multicarrier symbol in the context

²⁶ In the context of the “using” terms, TQ Delta points to other claims in the patents and disclosures in the specification that recite a transceiver operable to (1) transmit messages using a forward error correction encoder and an interleaver, and (2) receive messages using a forward error correction decoder and deinterleaver. TQD Br. at 26. But this is not what this disputed claim describes, and the Court should decline TQ Delta's implicit invitation to rewrite it. *See Amgen Inc. v. Hoechst Marion Roussel*, 314 F.3d 1313, 1342 (Fed. Cir. 2003).

²⁷ This term appears in claim 10 of the '354 Patent.

of a discrete multitone modulation system “is the sum of the full collection of carriers modulated by the system.” *Id.* at ¶ 84. The intrinsic record of the ’354 Patent fails to inform a POSITA how a multicarrier symbol is subdivided into different subsets of carriers. TQ Delta’s own expert, Dr. Cooklev, has admitted that the term “multicarrier symbol” appears only in the claim language, and, when asked, he could not explain how the multicarrier symbol comprises individual subsets of carriers. *See* Cooklev Dep. Tr. at 77:10-79:16. Moreover, TQ Delta’s opening claim construction brief fails to cite any language in the ’354 Patent specification that explains *how* the multicarrier symbol is divided and therefore “comprises” a first and second plurality of carriers. Because this term is not “precise enough to afford clear notice of what is claimed,” it is indefinite. *Nautilus*, 134 S. Ct. at 2129.

ii. “Receive A First Plurality Of Bits On The First Plurality Of Carriers Using A First SNR Margin; Receive A Second Plurality Of Bits On The Second Plurality Of Carriers Using A Second SNR Margin”²⁸

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary	Indefinite

This phrase is indefinite. As Dr. Zimmerman explained, a POSITA would not understand the meaning of “using” a “[first/second] SNR margin” to “receive a [first/second] plurality of bits on the [first/second] plurality of carriers.” Zimmerman Decl. at ¶¶ 87-91. For instance, the language of claim 10 of the ’354 Patent is directed to receiving information bits. By contrast, bit loading is performed with the transmitter portion of the transceiver—not the receiver portion. *Id.* at 89; *see also* ’354 Patent at 1:57-67 (“required SNR to *transmit* 4 QAM bits”). Therefore, it is unclear to a POSITA how the transceiver is operable to *receive* a [first/second] plurality of bits *using* an SNR margin. Moreover, assigning different SNR margins, as described in the ’354 Patent

²⁸ This term appears in claim 10 of the ’354 Patent.

specification and discussed in TQ Delta’s opening brief, fails to describe *how* the SNR Margin is used to “receive” a [first/second] plurality of bits. *See* ’354 Patent at 3:27-33, 4:10-11; 5:20-24, 9:22-24 (discussing assignment of SNR margin). Because the ’354 Patent fails to inform, with reasonable certainty, what is intended by this claim term, the Court should find this term indefinite.

iii. “Wherein The First SNR Margin Provides More Robust Reception Than The Second SNR Margin”²⁹

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary	Indefinite

This phrase is indefinite. As described in Dr. Zimmerman’s declaration, a POSITA would not understand *how* the first SNR margin (at the carrier level) “*provides* more robust reception” than the second SNR margin (at the carrier level). Zimmerman Decl. at ¶¶ 92-96; ’354 Patent at 1:45–49. In the context of SNR Margins, “robustness” means “the ability to maintain a specified quality of operation under uncertain or changing operating assumptions” at the system level. Zimmerman Decl. at ¶ 94. TQ Delta and its own expert acknowledge that the ’354 Patent specification describes robustness only as a measurement of the overall system. *See* TQD Br. at 29; ’354 Patent at 2:17-51; Cooklev Dep. Tr. at 86:7-87:18. Not only does the specification fail to describe *how* an SNR margin (at the carrier level) provides more robust reception at the system level, but it also fails to describe how the SNR Margin, as opposed to other known factors, *provides* more robust reception. Zimmerman Decl. at ¶ 94. This term is therefore indefinite. *See id.* at ¶ 96.

iv. “Signal To Noise Ratio (SNR) Margin” / “SNR Margin”³⁰

TQ Delta’s Proposed Construction	Defendants’ Proposed Construction
Plain and ordinary meaning. No construction necessary	a parameter used in determining the number of bits allocated to each of a plurality of

²⁹ This term appears in claim 10 of the ’354 Patent.

³⁰ These terms appear in claims 10, 11, and 12 of the ’354 Patent and claim 16 of the ’988 Patent.

	carriers, where the value of the parameter specifies an extra SNR requirement assigned per carrier in addition to the SNR required to maintain a specified bit error rate (BER) for the communication link at a specified bit allocation
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Defendants propose to construe this term to “assist the jury and provide clarity for the triers of fact to determine [in]validity and [non]infringement.” *Alexsam, Inc. v. Simon Prop. Grp., L.P.*, No. 2:19-cv-331-RWS-RSP, 2021 U.S. Dist. LEXIS 255029, at *18 (E.D. Tex. Nov. 15, 2021). Defendants’ proposal finds direct support in the shared specification of the ’354 and ’988 Patents (see ’354 Patent at 2:4-9), and TQ Delta previously agreed to the same construction in the ADTRAN Case, 2018 U.S. Dist. LEXIS 71869, at *7-8 (D. Del. Apr. 27, 2018). TQ Delta, which proposed its own claim construction in the ADTRAN case and failed to argue that the plain and ordinary meaning applied, is estopped from proposing a different construction here. *See id.*; see also *Love*, 677 F.3d at 261 (holding that judicial estoppel prevents a party from asserting an inconsistent position taken in a previous proceeding).

III. CONCLUSION

For the foregoing reasons, Defendants respectfully request that the Court adopt their proposed claim constructions.

Respectfully submitted, this 6th day of May, 2022

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CERTIFICATE OF SERVICE

I hereby certify that on this 6th day of May, 2022, I electronically filed the foregoing DEFENDANTS' RESPONSIVE CLAIM CONSTRUCTION BRIEF with the Clerk of Court using the CM/ECF system, which will automatically send notification of such filing upon Counsel of Record.

/s/ M. Scott Stevens

M. Scott Stevens